Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A ~~Method~~ method for detecting the angular position of a brushless electric motor, of the type in which the emission of a polarity signal of the back electromotive force by a detection circuitry associated with the motor is provided, comprising:

detecting a polarity signal of a back electromotive force from a winding of the motor using a detection circuit; ~~and~~

using a bi-directional counter to count a difference in residence time of logic states ‘0’ and ‘1’ at an output of said detection circuitry; and

enabling the bi-directional counter around an expected zero-crossing of said back electromotive force with a counting window having an arbitrary duration.

2. (Curently Amended) A method ~~Method~~ according to claim 1 wherein said counter is a digital up/down counter ~~and is enabled around an expected zero-crossing of said back electromotive force with a counting window having an arbitrary duration~~.

3. (Currently Amended) A method ~~Method~~ according to claim ~~2~~ 1 wherein said counting window has an arbitrary duration, symmetrical with respect to the expected zero-crossing.

4. (Currently Amended) A method ~~Method~~ according to claim ~~2 wherein~~1, comprising varying the duration of the counting window ~~varies~~ arbitrarily during driving of the motor.

5. (Currently Amended) A method ~~Method~~ according to claim ~~2 wherein a~~1, comprising zeroing ~~of~~ the counter ~~takes place~~ at a start of each counting window, or at an arbitrary moment before such a time period.

6. (Currently Amended) A method ~~Method~~ according to claim ~~2 wherein the counter is~~1, comprising periodically ~~disabled~~ disabling the counter from counting inside the counting window.

7. (Currently Amended) A method ~~Method~~ according to claim 1 ~~wherein an increase in the counter takes place together~~, comprising increasing a count of the counter with a reception at an input of the counter of a logic state '0', ~~whereas a decrease takes place together~~and decreasing the count of the counter with a reception at the input of a logic state '1' in said counting window.

8. (Currently Amended) A method ~~Method~~ according to claim 7 ~~wherein~~, comprising varying a counting frequency of the counter ~~can vary~~ during various driving phases of the motor.

9. (Currently Amended) A method ~~Method~~ according to claim 1 ~~wherein~~ , comprising using a value assumed by the counter at an end of each counting window ~~is used~~ in formulas to estimate an instantaneous position of the rotor, a period between two zero-crossings, and a speed of rotation.

10. (Currently Amended) A method ~~Method~~ according to claim 9 ~~wherein an algorithm~~ , comprising computing the period between two zero-crossings ~~operates~~ according to the algorithm

Period(n) = Period(n-1) + K1*Delta(n-1) ~~(EQ 4)~~

where:

"Period(n-1)" ~~resulted~~ results from a calculation carried out at an end of a previous window,

Delta is the calculation carried out at the end of the last window and is a filtered value of position information of a real zero-crossing~~s~~ with respect to ~~the~~ an expected ~~one~~ zero crossing at the base;~~ and,~~

"Period(n)" is the period which separates from a previous zero-crossings calculated at the end of the last counting window; and

K1 and K2 are generic parameters whose value can be established according to filtering requirements.

11. (Currently Amended) A method ~~Method~~ according to claim 10~~ wherein~~ , comprising modifying values of the generic parameters ~~are modified~~ arbitrarily during various driving phases of the motor.

12. (Currently Amended) A method ~~Method~~ according to claim 10~~ wherein~~, comprising arbitrarily alternating the algorithm ~~is arbitrarily alternated~~ with any known method for detecting the position of the rotor.

13. (Previously Presented) A method for detecting a rotor position in a brushless electric motor, comprising:

detecting a back electromotive force in a winding of the motor;

determining a polarity of the back electromotive force;

incrementing a counter up or down according to the polarity of the back electromotive force;

repeating the determining and incrementing steps at a selected frequency during a selected time period; and

establishing a true point of zero crossing based upon a count of the counter at the end of the selected time period.

14. (Cancelled)

15. (Previously Presented) A method for detecting a rotor position in a brushless electric motor, comprising:

detecting a back electromotive force in a winding of the motor;

estimating a point of zero crossing of the back electromotive force;

determining a polarity of the back electromotive force;

incrementing a counter up or down according to the polarity of the back electromotive force; and

repeating the determining and incrementing steps at a selected frequency during a selected time period.

16. (Original) The method of claim 15, further comprising selecting the selected time period such that the estimated point of zero crossing falls at a midpoint of the selected time period.

17. (Cancelled)

18. (Previously Presented) The method of claim 13 wherein:

the selected time period is one of a plurality of selected time periods; and

the method further comprises performing the detecting, determining, incrementing, and repeating steps during each of the plurality of selected time periods.

19. (Original) The method of claim 18, further comprising zeroing the counter prior to a beginning of each of the plurality of the selected time periods.

20. (Original) The method of claim 18, further comprising establishing a speed of rotation of the motor based upon a measured time period between two consecutive established true points of zero crossing.

21. (Original) A method, comprising:

estimating a point of zero crossing of a back electromotive force of a winding of a motor;

establishing a time period beginning a first selected period prior to the estimated zero crossing, and ending a second selected period after the estimated zero crossing, the first and second selected periods being equal;

incrementing a counter repeatedly at a selected frequency during the time period;

determining, at each increment of the counter, a polarity of the back electromotive force;

incrementing the counter in a first direction if the polarity of the back electromotive force is positive;

incrementing the counter in a second direction if the polarity of the back electromotive force is negative; and

establishing a true point of zero crossing based upon a value of the counter at the end of the time period.

22. (Previously Presented) A system, comprising:

a comparator module configured to detect a back electromotive force in a motor winding and supply a digital signal at an output based upon a polarity of the detected back electromotive force;

a counter module configured to increment up or down at a selected frequency according to a digital value at the output of the comparator module;

a position detector module configured to estimate a point of zero crossing of the back electromotive force, and to determine a true position of a rotor of the motor based upon a count of the counter module at an end of a selected time period; and

an enable module configured to select the time period such that the estimated zero crossing occurs at a midpoint of the time period, and to enable the counter module during the selected time period.

23-24. (Cancelled)

25. (New) The system of claim 22 wherein the position detector module is further configured to determine a true point of zero crossing based upon a count of the counter module at an end of a selected time period.

26. (New) The method of claim 21, comprising determining a speed of rotation of a rotor of the motor based upon a period between the true point of zero crossing and an additional true point of zero crossing.

27. (New) A method for detecting the angular position of a brushless electric motor, comprising:

detecting a polarity signal of a back electromotive force from a winding of the motor, using a detection circuit;

using a bi-directional counter to count a difference in residence time of logic states '0' and '1' at an output of said detection circuitry during counting windows; and

zeroing the counter at a start of each counting window, or at an arbitrary moment before such a time period.

28. (New) The method of claim 26, comprising determining a true zero crossing based on a count of the bi-directional counter at an end of the counting window.

29. (New) The method of claim 27, comprising determining a rotation speed of the rotor based on a period between two true zero crossings.

30. (New) A method for detecting the angular position of a brushless electric motor, comprising:

detecting a polarity signal of a back electromotive force from a winding of the motor using a detection circuit;

using a bi-directional counter to count a difference in residence time of logic states ‘0’ and ‘1’ at an output of said detection circuitry during counting windows; and

varying a counting frequency of the counter during various driving phases of the motor.

31. (New) The method of claim 30, comprising zeroing the counter at a start of each counting window, or at an arbitrary moment before such a time period.

32. (New) A method for detecting the angular position of a brushless electric motor, comprising:

detecting a polarity signal of a back electromotive force from a winding of the motor using a detection circuit;

using a bi-directional counter to count a difference in residence time of logic states ‘0’ and ‘1’ at an output of said detection circuitry during each of a succession of counting windows; and

using a value assumed by the counter at an end of each counting window in formulas to estimate an instantaneous position of the rotor, a period between two zero-crossings, and a speed of rotation.

33. (New) The method of claim 32, comprising:

estimating a zero crossing based on previously determined zero crossings; and

establishing a counting window such that the estimated zero crossing is at a midpoint of the counting window.

34. (New) A method for detecting the angular position of a brushless electric motor, comprising:

detecting a polarity signal of a back electromotive force from a winding of the motor using a detection circuit;

using a bi-directional counter to count a difference in residence time of logic states '0' and '1' at an output of said detection circuitry during each of a succession of counting windows; and

computing a period between two zero-crossings according to the algorithm

Period(n) = Period(n-1) + K1*Delta(n-1)

where:

"Period(n-1)" results from a calculation carried out at an end of a previous window,

Delta is the calculation carried out at the end of the previous window and is a filtered value of position information of a real zero-crossing with respect to the expected zero crossing at the base;

"Period(n)" is the period which separates one zero crossing from a previous zero-crossing calculated at the end of a previous counting window; and

K1 and K2 are generic parameters whose value can be established according to filtering requirements.

35. (New) The method of claim 34, comprising establishing a real zero crossing based on a count of the counter at the end of each counting window.